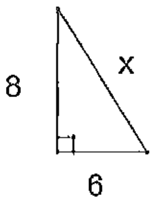
Mrs. Hayden

Name Key Date____________

201 Pythagorean Theorem and the Converse (Figures are not drawn to scale.)
(Answer in simplified radical form.)

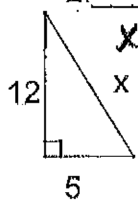
1. 10

$x^2 = 64+36$
100

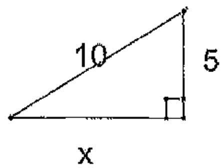


2. 13

$x^2 = 5^2+12^2$
$x = 13$



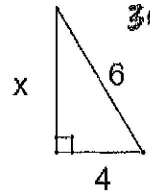
3. $5\sqrt{3}$



$10^2 = x^2+5^2$
$75 = x^2$

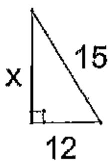
4. $2\sqrt{5}$

$36 = x^2+16$
$20 = x^2$

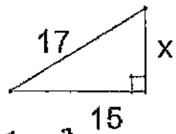


5. 9

$225 = x^2+144$
$81 = x^2$

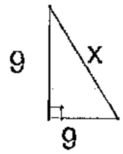


6. 8



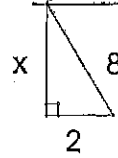
$289 = 225+x^2$
64

7. $9\sqrt{2}$



$x^2 = 81+81$
162

8. $2\sqrt{15}$



$64 = x^2+4$
$60 = x^2$

Determine if the numbers represent a triangle, if they do, then classify it as acute, right, or obtuse.

9. Acute 8,10,11 (64 100 121)
10. Obtuse 2,5,6 (4 25 36)
11. Acute 12,13,17 (144 169 289)
12. Right 8,15,17 (64 225 289)
13. Acute 4,4,4
14. Not △ 4,5,9
15. Obtuse A(-7, -3) B(-4, -1) C(0, -6) ON LL

16. The sides and classification of a triangle are given below. The length of the longest side is the integer given. What value(s) of *x* make the triangle? (Note: you may need to use quad. Form.)

on LL

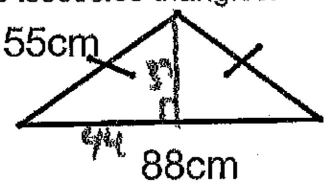
a. *x*, *x*, 10; obtuse
b. *x*, *x+4*, 10; acute

(a) $5 < x < 5\sqrt{2}$ (b) $x > -2+\sqrt{46}$

Find the area of the isosceles triangles.

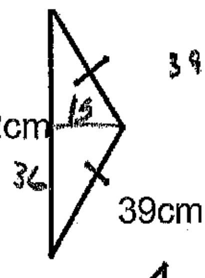
17. 1452 cm^2

$A = \frac{1}{2}\,88 \cdot 33$



18. 540 cm^2

$A = \frac{1}{2}\,15 \cdot 72$

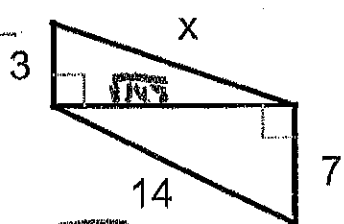


$39^2 = 36^2+h^2$
$15 = h$

Solve for x in the given picture.

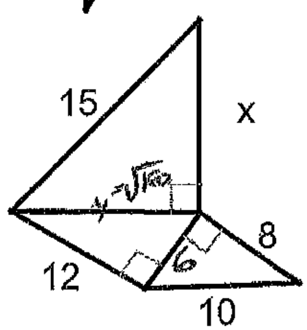
19. $2\sqrt{39}$

$196 = y^2+49$
$147 = y^2$
$3^2+147 = x^2$ $x = \sqrt{156}$



20. $3\sqrt{5}$

$6^2+12^2 = y^2$
$15^2 = 180+x^2$
$45 = x^2$



$AB = \sqrt{9+4} = \sqrt{13}$

$BC = \sqrt{16+25} = \sqrt{41}$

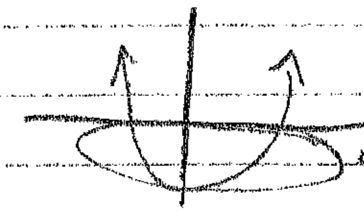
15. $AC = \sqrt{49+9} = \sqrt{58}$

$58 > 41 + 13$

54

Obtuse

16. ⓐ $10^2 > x^2 + x^2$



When < 0?

$100 > 2x^2$

$50 > x^2$

$-5\sqrt{2} < x < 5\sqrt{2}$

$0 = x^2 - 50$ $\approx \pm 7.07$

Restrictions

$x = \pm 5\sqrt{2}$

$x > 0$

Δ ineq. $2x > 10$

$x > 5$

Answer $\boxed{5 < x < 5\sqrt{2}}$

ⓑ $10^2 < x^2 + (x+4)^2$

$100 < x^2 + x^2 + 8x + 16$

$0 < 2x^2 + 8x - 84$

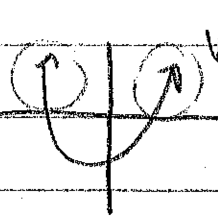
$0 < x^2 + 4x - 42$

$\frac{-4 \pm \sqrt{16 - 4(-42)}}{2}$

Set $= 0$ $0 = x^2 + 4x - 42$

$\frac{-4 \pm 2\sqrt{46}}{2}$

Restrictions



When? > 0

$-2 \pm \sqrt{46}$

$x > 0$

$x \approx 4.78$

$x + 4 > 0 \to x > -4$

$x \approx -8.78$

$2x + 4 > 10$

$x < -2 - \sqrt{46}$ OR $x > -2 + \sqrt{46}$

$2x > 6$

$x > 3$

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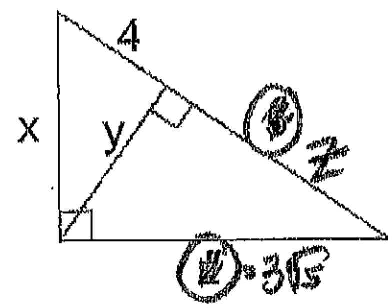
Geometric Mean—Find x, y, and z. (Figures not drawn to scale.)

1. $x = 6$ $y = 2\sqrt{5}$ $z = 5$



Factor

$\frac{4}{x} = \frac{x}{9}$

$x^2 = 36$

$\frac{4}{y} = \frac{y}{5}$ $y^2 = 20$

$y = 2\sqrt{5}$

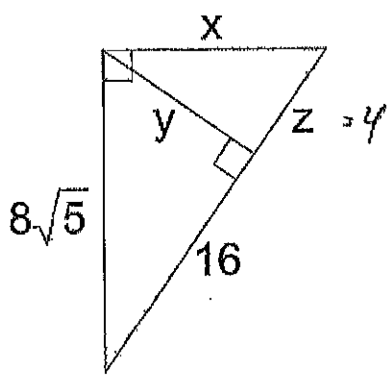
$\frac{z}{3\sqrt{5}} = \frac{3\sqrt{5}}{z+4}$

$z^2 + 4z = 45$

$z^2 + 4z - 45 = 0$

$(z+9)(z-5) = 0$ $z = 5$

2. $x = 4\sqrt{5}$ $y = 8$ $z = 4$



$\frac{16}{8\sqrt{5}} = \frac{8\sqrt{5}}{z+16}$

$16z + 256 = 320$

$16z = 64$

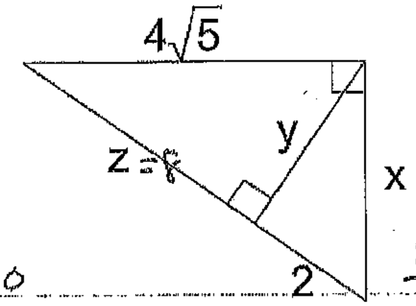
$z = 4$

$\frac{4}{x} = \frac{x}{20}$ $\frac{4}{y} = \frac{y}{16}$

$x^2 = 80$ $y = 8$

$4\sqrt{5}$

3. $x = 2\sqrt{5}$ $y = 4$ $z = 8$



Factor

$\frac{z}{4\sqrt{5}} = \frac{4\sqrt{5}}{z+2}$

$z^2 + 2z = 80$

$z^2 + 2z - 80 = 0$

$(z+10)(z-8) = 0$

$z = 8$

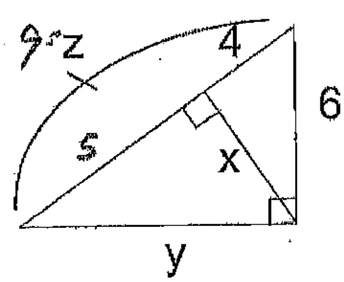
$\frac{8}{y} = \frac{y}{2}$

$y = 4$

$\frac{2}{x} = \frac{x}{10}$

$x^2 = 20$

4. $x = 2\sqrt{5}$ $y = 3\sqrt{5}$ $z = 9$



$\frac{4}{6} = \frac{6}{z}$

$4z = 36$

$z = 9$

$\frac{4}{x} = \frac{x}{5}$

$x^2 = 20$

$x = 2\sqrt{5}$

$\frac{5}{y} = \frac{y}{9}$

$y^2 = 45$

$y = 3\sqrt{5}$